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with the xylem vessels, and by the "cortical roots" that traverse the "soft bark." An interesting description is given of the behavior of these digesting roots ("sinkers") in penetrating tissue, and in sending out lateral outgrowths ("cortical roots") which spread extensively through the cortex of the host and in turn give rise to other "sinkers" that connect with the xylem. The first infection of a tree is brought about by birds, and the subsequent spread of the parasite is caused by the falling or washing of berries upon other parts of the host. The seed and seedling exhibit unusual resistance to desiccation, and so survive the more or less prolonged period of establishment, a period which may extend beyond the first growing season. A tree may become affected at any point where living tissue is exposed or covered only by a thin layer of cork with lenticels, but the most vulnerable points are the young branches, and sometimes the buds. Various suggestions are made as to the treatment of trees subject to the attacks of this parasite. —J. M. C.

Latex.—Miss DIANA BRUSCHI has made a study of the latex of five species of Euphorbia and three of Ficus,[20] in an endeavor to clear up in a measure the contradictory results of various investigators, of which the two most recent studies by MOLISCH (1901) and KNIEP (1905) are characteristic. Dr. BRUSCHI finds that the quantity of latex, its pressure, and its aspect vary with the season in the figs, *Ficus Carica* and *F. pseudocarica*, but not the euphorbias. Of the components of the latex the proteins vary in quantity with the season in the two figs named, in which they are abundant; but they are scant in *F. elastica* and the euphorbias. The fats are without doubt the most important plastic components and they clearly follow the variations in photosynthesis. The starch remains an enigma. Reducing sugars increase a little in *F. Carica* and *F. pseudocarica* but change little in the others. On the whole Miss BRUSCHI upholds MOLISCH's view of the latex as a cell sap circulating in a living plasma sac, which is not entirely aplastic. Inasmuch as it contains many substances easily utilizable as foods, the utilization of these foods is correlated with the activation and activity of the related enzymes. The ready use of the fats is certain, and they are the principal if not the only plastic material; the indifference of the starch is supposed to be due to the lack of an amylase energetic enough to attack it. As the latex tubes run usually in the midst of organs well supplied with foods by photosynthesis, their content is yielded only when all other foods are exhausted.—C. R. B.

Rhizoids of liverworts.—WEINERT has investigated the growth and tropisms of the rhizoids of Marchantia and Lunularia.[21] He finds that light promotes the formation of rhizoids from gemmae, and is quite indispensable for the development of the divergent rhizoids of the thallus; further, only a few of the appressed sort, and these with poor pegs, are formed in darkness. Even if a thallus raised in darkness be afterward lighted, it forms no divergent rhizoids; and if such a thallus after being cut off regenerates itself, the new part forms none; the power once lost seems finally gone. Rhizoids cut off are not regenerated, but new ones are formed, either from surface cells of the thallus or from a cell internal to the first rhizoid-producing cell, in which case the new one grows through the old, as previously reported by KNY, DIXON, and others. WEINERT finds that small pegs occur even in true divergent rhizoids, which indicates to the reviewer that the possession of rhizoids of two kinds has been overvalued as a marchantiaceous character, for example in the case of Monoclea.

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[20] BRUSCHI, DIANA, Contributo allo studio fisiologico del latice. Annali di Botanica 7:671–701. 1909.

[21] WEINERT, HANS, Untersuchungen über Wachstum und tropistische Bewegungserscheinungen der Rhizoiden thallöser Lebermoose. Bot. Zeit. 67^1:201–230. *figs. 11.* 1909.

While the formation of rhizoids on the under side of gemmae is promoted by gravity, the hairs themselves are not geotropic, but are highly sensitive to light, being negatively phototropic even in weak red light, but strangely enough, not in blue light. The divergent rhizoids of the thallus are very slightly phototropic (negative). The appressed rhizoids show no tropisms.—C. R. B.

The origin of Oenothera gigas.—GATES[22] has investigated the relation of the number of chromosomes in *Oenothera gigas* to its size. This mutant from *O. Lamarckiana* has double the number of chromosomes (28) possessed by the parent form and by the other mutants examined. In every tissue examined, the cells of the mutant are conspicuously larger than those of the parent form, and the nuclei of the pollen mother cells during synapsis are about twice as large. The author suggests that increase in the size of nuclei and cells, consequent upon or coincident with the doubling of the chromosome number, and change in the relative dimensions of the cells in some cases, will account for all the differences between the two species. There is no evidence of the presence of new or additional unit characters in *O. gigas*. It is concluded that the facts strongly support the view of the independence and genetic continuity of the chromosomes, whatever may be their rôle in heredity. It is suggested as most probable that the double number of chromosomes in *O. gigas* originated soon after fertilization, by the failure of a nucleus to complete its division after the chromosomes had divided. This doubling of the number of chromosomes, the author thinks, "cannot be a common method of species formation, and bear no necessary relation to the general processes of evolution in the group." He speaks of it rather as an incident among evolutionary phenomena.—J. M. C.

Farm water supplies.—The Bureau of Plant Industry has been cooperating with the Minnesota State Board of Health in an investigation of the farm water supplies of that state, and a report by KELLERMAN and WHITTAKER has now been published.[23] Numerous cases and their details are presented, classified under

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[22] GATES, REGINALD RUGGLES, The stature and chromosomes of *Oenothera gigas* DeVries. Archiv. für Zellforschung 3:525–552. 1909.

[23] KELLERMAN, KARL F., AND WHITTAKER, H. A., Farm water supplies of Minnesota. Bull. 154, Bur. Pl. Ind., U. S. Depart. Agric. pp. 89. *figs. 73.* 1909.